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New distribution records of *Catasetum confusum* G.A. Romero-González (Cymbidieae, Epidendroideae, Orchidaceae) from Brazil

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Abstract. Until now, *Catasetum confusum* G.A. Romero-González was known from the states of Goiás, Mato Grosso and Tocantins. The present study extends the distribution of this species to the states of Bahia and Piauí, as well as the Federal District, based on herbarium specimens deposited at CEN, RB, UFMT and UPCB. Following IUCN criteria, *C. confusum* is Endangered due to its area of occupancy, geographic distribution and habitat quality, showing the importance of these new records.

Key words. Caatinga species; Catasetinae; Cerrado species; expansion of distribution; conservation status

The genus *Catasetum* Rich. *ex* Kunth is represented in Brazil by ca. 100 species (Barros et al. 2015) and has been recorded in diverse biomes and the various phytophysiognomies within these biomes. In this genus the species have high morphological plasticity and many easily adapt to new areas and environmental changes (Petini-Benelli 2012).

Most of the species are epiphytic herbs and many occur in specific habitats where they are restricted to small areas with unique characteristics. *Catasetum confusum* G. Romero-González (Romero-González 1993) is in this category because, until now, it was rarely recorded and known only from small fragments (e.g., in Goiás and Mato Grosso) and preserved areas (e.g., Lagoa da Confusão, in Tocantins) of the Cerrado.

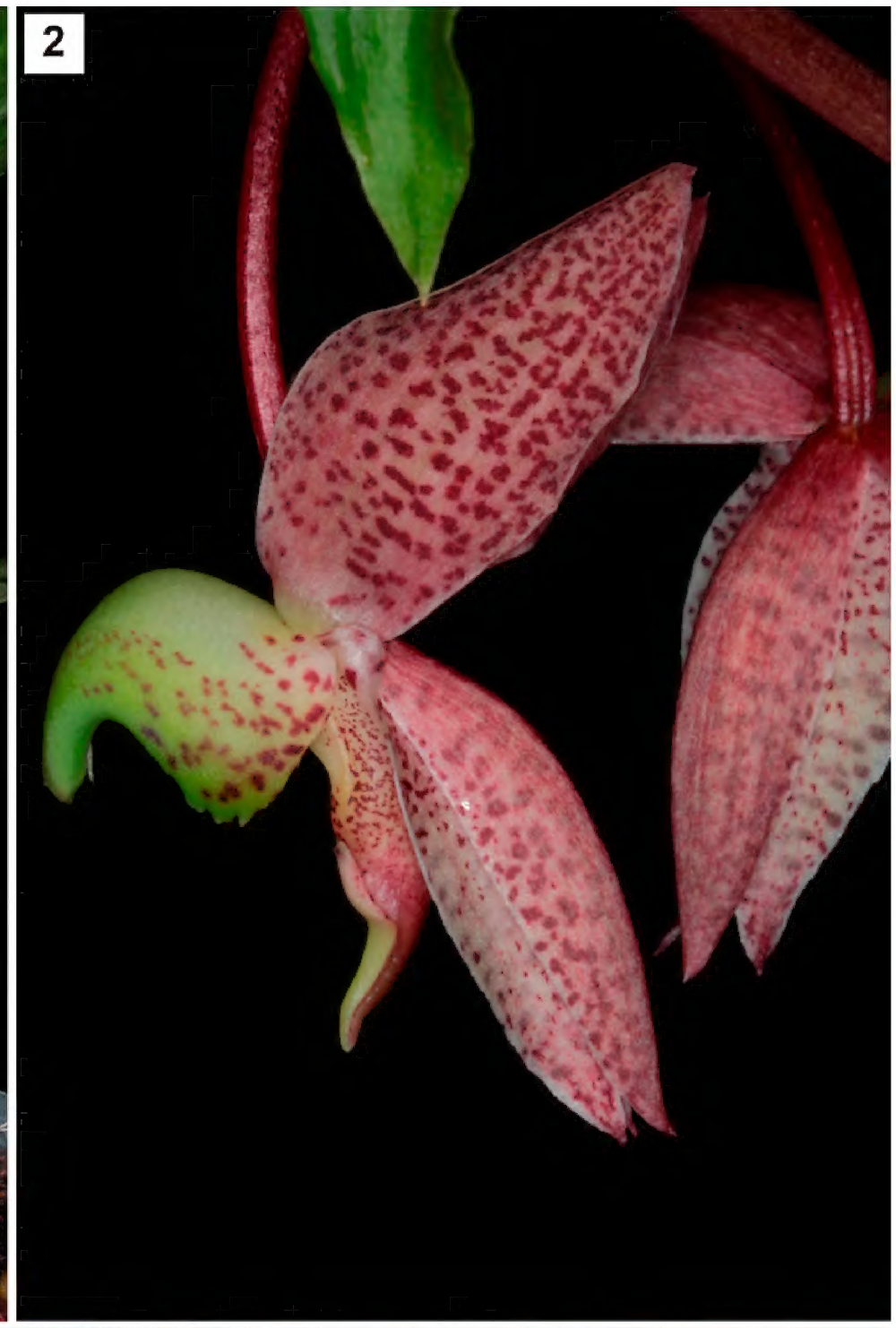
While preparing a monograph of *Catasetum* for Mato Grosso state and a phylogeny of this Neotropical genus, the distributions of species were revised based on collections made throughout the state, material collected by collaborators, and specimens from national and international herbaria that were studied in person or online.

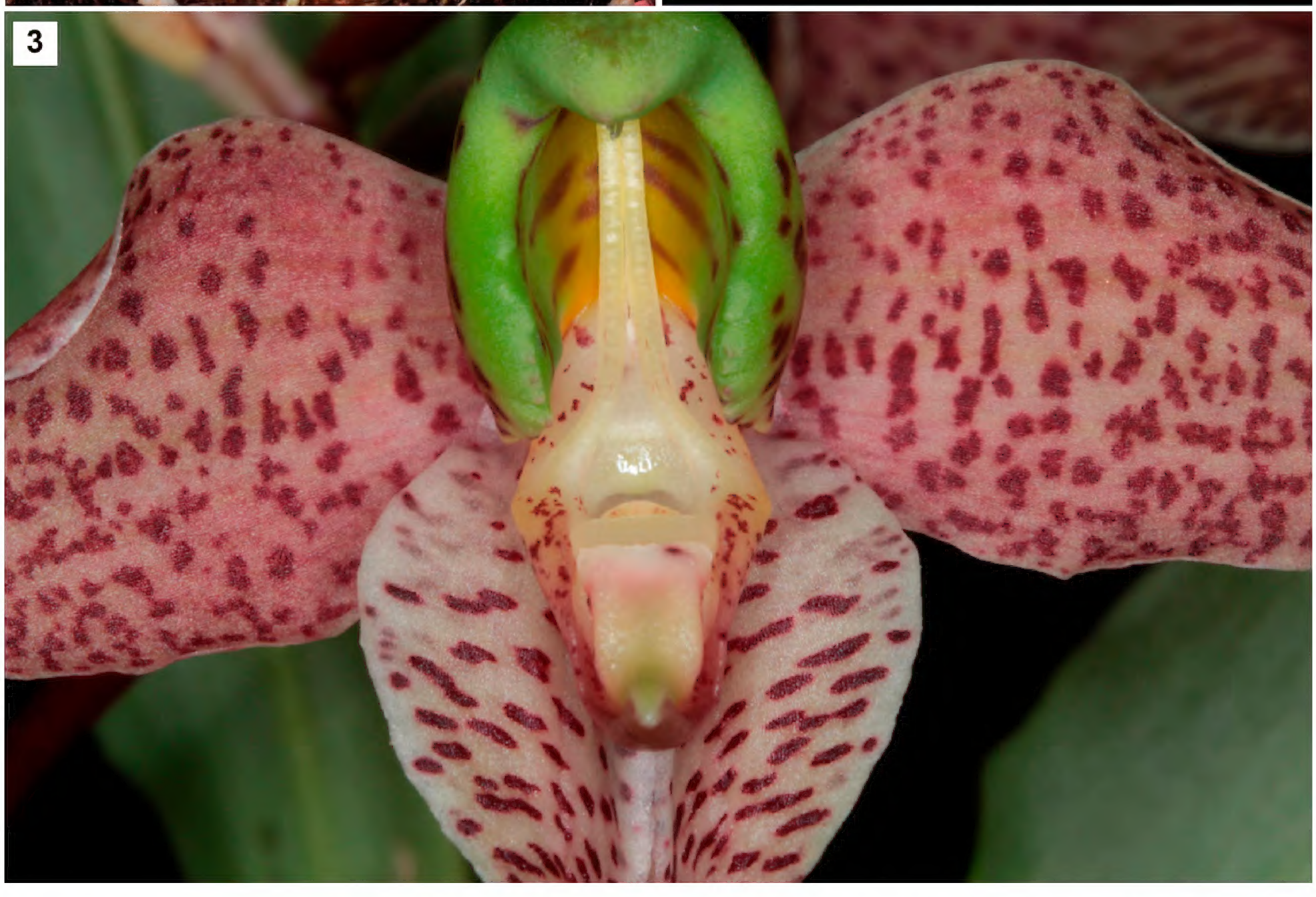
The material collected was compared to herbarium specimens deposited at CEN, HB, HUTO, MBM and UFMT (acronyms according to Thiers 2016), and voucher specimens were pressed according to Petini-Benelli (2016) and deposited at MBM, RB, UFMT and UPCB. The geographic distribution of *C. confusum* was made using the program DIVA-GIS 7.5 (Hijmans et al. 2012). The conservation status of the taxon was assessed following IUCN (2001) criteria, and considered the number of locations, area, extent and quality of habitat. The extent of occurrence (EOO) and area of occupancy (AOO) were calculated using the software Geospatial Conservation Assessment Tool (GeoCAT), where the AOO was based on a defined cell width of 2 km (Bachman et al. 2011).

Catasetum confusum G.A.Romero-González. Brittonia 45: 237. 1993. Holotype: Brazil: Goiás: margem do Rio Tocantins. ♂, *ex hort. M. Brichta s.n.* (HB 66772!).
Figure 1.

Epiphytic herb. *Pseudobulbs* aggregated, fusiform, variable in size. *Inflorescence* basal, initially erect, later arched, with up to 20 non-resupinate flowers, to 50 cm long. *Pedicel* 27–29 × 2.8–3 mm, distally unicinate, ovary sulcate. *Sepals* slightly concave, apex obtuse; dorsal sepal 26–30 × 10–13 mm, ovate; lateral sepals 26–30 × 11–14 mm, ovate to elliptic, reflexed. *Petals* 22–26 × 8–10 mm, connivent with dorsal sepal, narrowly ovate, apex slightly acute, apiculate, sparsely ciliate distally. *Labellum* 13–16 × 7–10 mm, saccate, the sac 10–12 mm deep, trilobed, lateral lobes rounded, generally green; interior of labellum with a keel along the surface, frontal lobe 2–3 mm long, margin with small teeth, apex generally acuminate, lateral lobes slightly revolute. *Column* 18–20 × 4–5 mm, trigonous. *Clinandrium* 5–6 mm long. *Antennae* 8–10 × 0.8–0.9 mm, parallel convergent, symmetrical. *Anther* 7–8 × 4.5 mm, whitish, margins vinaceous. *Pollinia* 2, yellow. Pistillate flowers and fruits not seen.

Selected material. Brazil: Bahia: São Desidério; Fazenda Palmeiral, 15-X-2006, ♂, *Santos-Amaral, A. 2874* (CEN); Distrito Federal, 8-II-2014, ♂, *Garcia, L.J. ADA579* (UFMT; spirit 579). Goiás: Iporá, 31-I-2015, ♂, *Monteiro, N. ADA264*, (UFMT; spirit 264). Mato Grosso: Tangará da Serra, 15-I-2014, ♂, *Petini-Benelli, A. APB-TG05* (UPCB; spirit). Piauí: Santa





Figures 1–3. *Catasetum confusum*. **1.** Vegetative form of a blooming plant growing in a greenhouse. **2.** Male flower, lateral view. **3.** Male flower, close-up view of labellum focusing on the column-pollinarium-antennae set. Photos: ECS.

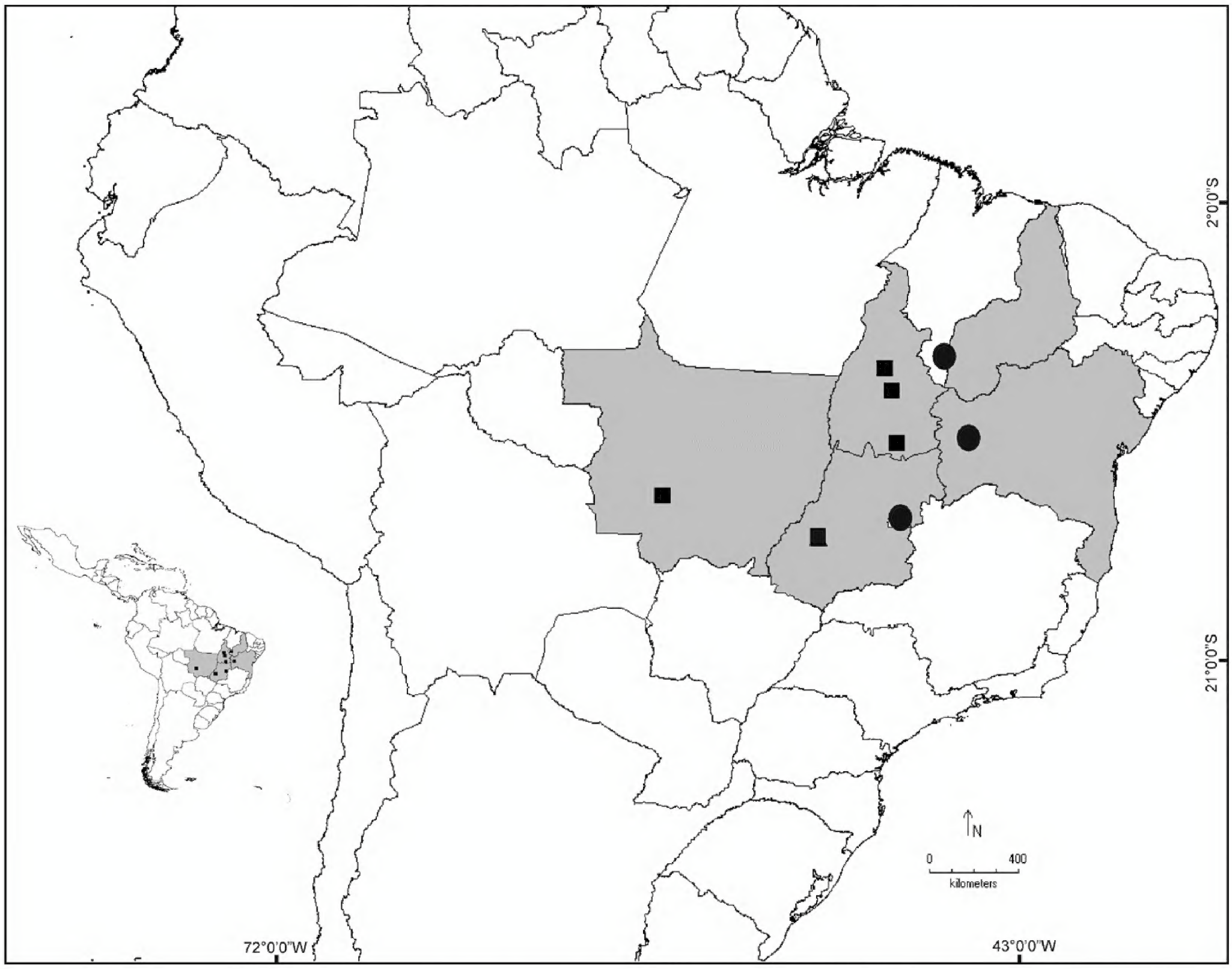


Figure 4. Distribution of *Catasetum confusum*. Squares are previously known localities of occurrence, circles indicate new records.

Filomena, V-2013, flowers in cult. 10-II-2014, ♂, *Ariati, V. et al. 955* (MBM, RB). Tocantins, Miracema do Tocantins; área de construção da Ferrovia Norte-Sul, km 683 + 900. 2-IV-2009, ♂, *Santos, W.F. 11* (HUTO); Palmas; sub-bacia do Ribeirão São João. 19-I-2006, ♂, *Santos, E.R. 320 & Pereira, C.B.* (HUTO); Paraná do Tocantins; 12°54′24″ S, 047°13′02″ W, elev. 420 m., 4-IV-2004, ♂, *Sevilha, A.C. et al. 4122* (CEN).

Specimens at CEN, RB, UFMT and UPCB, and protologues of related species, were used to identify the collections of *C. confusum*. The complete list of examined material is shown in Table 1. Within the genus, *C. confusum* has unique morphological characters and is easily recognized when fresh or in herbaria. The globose labellum is very small (the smallest in this genus), with an apiculate frontal lobe and lateral lobes that are strongly curved to the central portion of the labellum, which touch at their extremities. For this reason, it resembles the head of a bird. The petals are fully reflexed and completely cover the pedicel. This morphology (an inflorescence resembling a flying hummingbird) does not change after being dried, making the species easy to recognize.

Table 1. List of *Catasetum confusum* vouchers examined, including the data for each sample. New records are highlighted (bold).

Locality	Latitude	Longitude	Collector / Collection number	Herbarium number
BA: São Desidério	**–12.3633**	**–44.9733**	**A. Santos-Amaral, 2874**	**CEN 66365**
DF: BR-070	**–15.7333**	**–47.9000**	**L.J. Garcia, ADA579**	**UFMT 41233; Spirit 579**
GO: Iporá	–16.4419	–51.1178	N. Monteiro, ADA264	UFMT 42495; Spirit 264
GO: Rio Tocantins	no location		M. Brichta, s/nº	HB 66772 (holotype)
MT: Tangará da Serra	–14.7333	–57.4500	A. Petini-Benelli, APB-TG05	UPCB Spirit
PI: Santa Filomena	**–09.1122**	**–45.9222**	**V. Ariati, 955 et al.**	**MBM 390766; RB 613194**
TO: Miracema do Tocantins	–09.5672	–48.3917	W.F. Santos, 11	HUTO 2012
TO: Palmas	–10.4647	–48.0927	E.R. Santos 320 & C.B. Pereira	HUTO 182
TO: Paraná do Tocantins	–12.6153	–47.8831	A.C. Sevilha, 4122 et al.	CEN 64441

Catasetum confusum was originally described from the state of Goiás (Romero-González 1993). However, according to Barros et al. (2015), it occurs in the states of Goiás, Mato Grosso and Tocantins, in areas of the Cerrado in riparian or gallery forest. The present study extends the distribution of this taxon to Bahia, Piauí and the Federal District (Fig. 4).

Catasetum is represented in Bahia by 13 species, some of which occur in Amazonia, such as *C. gnomus* L.Linden & Rchb.f. (Azevedo & van den Berg 2007, Bastos & van den Berg 2012a, b, Buzatto & Machado 2011, Vieira et al. 2014, and Toscano de Brito 1995, 2005). The material recorded from Bahia is deposited in CEN and was collected in 2006 in an area of riparian forest in the municipality of São Desidério, in extreme western Bahia, which borders Tocantins state and is within the Cerrado biome. In relation to the original area, the new record extends the distribution of the species approximately 600 km. No records were found by us of *Catasetum* species that share the same habitat with *C. confusum* in São Desidério. Therefore, this is the first record of the genus for the municipality.

The collection from the Federal District was made in February 2014 in an area of Cerrado s.s. that is impacted by pastures, and was maintained in cultivation until it flowered. According to Barros et al. (2015), there are 3 species in the Federal District, *C. barbatum* (Lindl.) Lindl., *C. fimbriatum* (C.Morren) Lindl. and *C. spitzii* Hoehne, all of which occur in various phytophysiognomies of the Cerrado biome. The occurrence areas cited for *C. confusum* in the state of Goiás and the Federal District are relatively close to each other (approximately 300 km). In addition, this distance is approximately 600 km southwest from the record made in Bahia.

The most relevant record of *C. confusum*, considering the large gap in the knowledge of *Catasetum*, is from the state of Piauí where there were only 2 known species. Located in the Caatinga and Cerrado biomes, this region is also a great transition zone between the Amazon forest and the Cerrado. According to Ab'Sáber (2001), the proximity and the combination of these 3 biomes introduces a surprising factor when considering the richness of species in the area, with probable new records. The municipality of Santa Filomena, where *C. confusum* was collected in Piauí, has an area less than 5,200 km^2 (IBGE 2016) and vegetation typical of Caatinga and Cerrado. In this municipality, the Estação Ecológica de Uruçuí-Una is in the northeastern part and Parque Nacional das Nascentes do Rio Parnaíba is at the southern limit (IBGE 2016). This collection extends the distribution of the taxon approximately 500 km and is the first record of the genus for the Santa Filomena region.

Using GeoCAT (Bachman et al. 2011), an area of occupancy (AOO) of 32 km^2 from 8 localities and an extent of occurrence (EOO) of 582,585.98 km^2 was calculated. Based on the new records, the extent of occurrence increased 221,044.25 km^2 and the area of occupancy increased 12 km^2. Following IUCN (2001) criteria, *C. confusum* can be classified as Endangered [EN B2ab(iii)] because of its area of occupancy, geographic distribution and habitat quality.

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